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PLASTICS & MOLDED PRODUCTS

Volume 7 OCTOBER 1931 Number 10

Improved Black and Brown

MOLDERS REPORT GREAT SUCCESS WITH
QUICK-CURING, FAST-FLOWING, UNIFORM DUREZ

A few weeks ago, without so much as a change in code numbers, General Plastics put in production a greatly improved Durez. No public announcement was made. Shipments went out as usual.

What the molders say

Judging from enthusiastic reports of the molders themselves, no other material has ever acted in the press like Durez 2260 Black and 1438 Brown! We strongly urge any molder who has not yet used these improved materials to try them to prove their superiority for himself.

Durez Black and Brown—which have been constantly improved—have a greater flow than ever before. They have a plasticity which has not been obtainable up to now without consequent slow cure. From 25 to 50 per cent is cut from curing time. And they have a higher dielectric and structural strength, a greater chemical and water resistance than has ever before been possible with standard materials. They are increasing production and are a definite aid to continuous, rapid molding.

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One of the most important changes for the better with Durez Black and Brown is the curing time. As a test, improved Durez and a competitive material were placed in a press molding identical pieces. Durez cured in a two-minute cycle, giving a fine finish and a very thin fin. The competitive material barely cured with a cycle twice as long!

Molders will find Durez ideally suited to pieces that require a high finish. The surface has a smooth and lustrous sheen, brilliant as ebony. Yet, with all these improvements, there is no increase in price! . . . We shall be glad to go into further details about Durez, and discuss any phase of molding involving its use. Write now for information and free samples to General Plastics, Inc., 210 Walck Road, North Tonawanda, New York. Also New York, Chicago, San Francisco, Los Angeles. *The makers of Durez are also the makers of Durez Insulating Varnishes.*

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Calco Condensation Red C
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Calco Condensation Brown Y
Calco Condensation Brown RY
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Calco Condensation Gray B
Calco Condensation Black #1500
Calco Condensation Black #1601

THE CALCO CHEMICAL COMPANY, INC.
BOUND BROOK, N. J.

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Reg. U. S. Pat. Off.

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PLASTICS PUBLICATIONS, INC., PUBLISHER

TEXTOLITE MOLDED*

has behind it the experience and the resources of the

GENERAL ELECTRIC COMPANY

This means much:

A stocking-examiner pole—Textolite molded. This piece, molded for the Textile Machine Works, Reading, Pa., meets the requirements for a part that must have extremely smooth surfaces and great resistance to abrasion. Although more than 3 feet long, it weighs only 9½ lb.

To our customers --

Because in every Textolite molded part there are years of experience and knowledge gained by the General Electric Company in producing over 700,000,000 molded pieces, supported by the extensive facilities for research and development in the General Electric laboratories.

To us --

Because it puts us in the position to offer Textolite molded to our customers with the satisfaction of knowing that they are receiving the best the molding industry can offer in the way of service, quality, and manufacturing ability.

There is a Plastics Department salesman in your nearest G-E office. Possibly he could suggest an application of Textolite which would help you turn out a lighter, stronger, and more attractive product — and lower the cost of assembly operations.

*The trade name adopted by the General Electric Company to identify hot-molded products of its manufacture in which a synthetic resin is used as a binder.

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GENERAL ELECTRIC

SALES AND ENGINEERING SERVICE IN PRINCIPAL CITIES

PLASTICS & MOLDED PRODUCTS

Reg. U. S. Pat. Off.

Volume 7 OCTOBER, 1931 Number 10

Douglas Woodruff to Guide Molded Section's Destiny Next Year

Chairman's Message Cites Need for Fair Prices

THE aim of every industry, large or small, should be stabilization. Throughout the country during the past two years has spread the result of a lack of balance. Many trade organizations have attacked this problem with the determination to accomplish, through sound planning, a fair price for their products and a wide distribution. Our own Association, even in a small way, has I believe helped to alleviate a more serious depression. I most warmly congratulate those who have been the leaders in such an effort, urging them to continue their policies and to lay the foundations for the future success of this industry. Other untouched markets are waiting for our manufacturing facilities. If we can labor together, through our association, to secure a fair price for our merchandise, these markets can be developed and expanded.

Douglas Woodruff

Chairman, Molded Insulation Section, NEMA

Mr. Woodruff is president of the Auburn Button Works, Inc., which was founded by his father in 1876. He joined the company 26 years ago after graduating from Hotchkiss and Yale. He brings to his new office a fund of business experience which should prove revitalizing to the industry as a whole.

ELECTION of officers for the ensuing year was one of the principal items on the agenda of the Molded Insulation Section of NEMA at its last meeting on September 18th. This is customary at this time, for the meeting was held in conjunction with the annual meeting of the parent organization, at the Hotel Commodore in New York City.

The newly elected secretary of the Molded Insulation Section is Mr. Ronald W. Post, vice-president and sales manager of the Boonton Rubber Manufacturing Co., pioneer molders of Bakelite. He is well grounded in the problems of the industry, being with his present company since 1915, after getting his M. E. from Cornell and a few years in general engineering practise and subway construction work. Mr. Post is married, has two children, and ranks well in the New Jersey League of Molder-Golfers.

Mr. Harry D. Randall, vice-chairman-elect of the Section, has been active in committees since the formation of the group. This, together with his broad sales experience in the industry, makes him a valuable addition to the new administration. He is Manager of Sales of the Plastics Department of the General Electric Co. A graduate of Amherst, followed by post-graduate work at M. I. T., he was with Westinghouse and Allis-Chalmers before joining G. E. twenty years ago.

THE new administration of the Molded Insulation Section went right to work in completing the working organization, that is, the Chairman, Mr. Woodruff, selected the committees which will aid in carrying out the programs for the year. The committees and members are:

Advisory

Prescott Huidekoper, Chairman
R. E. Coleman
R. H. Cunningham
B. E. Schlesinger
S. M. Stone
Douglas Woodruff

Trade Practices

J. B. Neal, Chairman
E. F. Bachner
J. P. Case
W. A. Freyer
R. W. Post
F. H. Shaw

Accounting

G. V. Sammet, Chairman
R. A. Austin
G. C. Wilson

Membership

G. C. Wilson, Chairman
B. F. Conner
Donald Dew
C. A. Kurz, Jr.
J. G. Rossiter
G. K. Scribner
B. E. Schlesinger

Technical

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F. J. Groten
Henry Kasch

Trade Research

H. D. Randall, Chairman
R. H. Allen
B. C. Budd
B. F. Conner
W. A. Freyer
W. L. Kelley
J. B. Neal
R. W. Post
J. G. Rossiter

Plastic Southern California

A picture of conditions and prospects in the industry on the Pacific Coast

By Raymond B. Stringfield

Stringfield & Oedekerk, Los Angeles

After earning degrees in chemistry and chemical engineering at the University of Southern California and M. I. T., Mr. Stringfield spent several years in the mining and rubber industries, latterly with the Goodyear Tire and Rubber Co., of Calif., as Chief Chemist. He is now a member of Stringfield and Oedekerk, custom molders.

SOUTHERN Californitus is a disease well known to most of the rest of the country, for the Chamber of Commerce has told far and wide how Los Angeles grew from 102,479 in 1900 to 1,238,048 in 1930, how the value of manufactures in the Los Angeles industrial district is over $1,200,000,000.00 a year, how Southern California crops bring $270,000,000.00 per annum, and her oil wells produce 500,000 barrels of oil per day. The All-Year Club tells you that there is an automobile for every 2.5 persons, and invites you to stroll the streets of Hollywood and dine and dance with the movie stars, but they don't tell you that molded plastics help drill the oil wells and irrigate the orchards, and that all movie film runs over molded Bakelite rollers in the developing tanks, for like most of the country, Southern California is not yet "plastic conscious."

We have often been told, "Don't tell anyone what you're making, you'll just be inviting competition". We don't believe it. We believe publicity is good for us and for the industry, and if competition knows what the facts are, it will at least be intelligent competition.

Before entering the field of phenol plastics, we spent years in the rubber industry, which in one respect is one of the unusual industries of the country. If Bill Smith, Supt. of the U. S. P. Rubber Co. wants to know if his milling costs are in line, he calls up Tim Black, Supt. of the Goodstone Rubber Co. and compares notes, and if Joe Brown, Chief Chemist of Goodstone has trouble with a certain grade of carbon black, he calls Fred Jones of the U. S. P. to see what luck they are having. By such comparisons, the rubber industry has made enormous technical strides in the last ten years, and the accompanying publicity has kept rubber in the public eye, and developed many new uses for rubber products. We believe the same thing will hold for the plastics industry, and the better we molders know each other and what we are doing, and the more we talk about our products, the more we make the public conscious of the possibilities and help develop business for all of us. So here's our picture, such as it is.

A Small Beginning—

There are five custom molding concerns in Southern California. We're all small. All of us together wouldn't make a good corner of Kurz-Kasch, but we have lots of fun. There are very few real production molding jobs as yet in Southern California. Altho manufacturers are increasing rapidly, only a few use molded products, and most of these are small and struggling. Almost every new job requires much missionary work, and very close contact with the customer and cooperation with his development department. We have more than our share of "nut" inventors, and the molded devices the doctors want in their efforts to keep Hollywood pure, make us think seriously of asking the University of Southern California to establish a new degree, "C. C.", standing for "Contraceptive Counsel". We have the man who brought in an article like a thumb-tack except for a small cup on the broad end, which he explained was to be used as a vacuum cup to attach the tack to the tongue, forming an "inside toothpick" to clean the teeth in peace and privacy with the mouth closed. And a good-looking young negro introduces himself as "Battling Tom", a professional boxer, and after burying his face in a handkerchief, hands us a glass eye, with the request that we please mold him one out of Bakelite or something that wouldn't break when his opponent popped him in the bad optic, and you'll admit that

if one makes his living in the squared circle, it's a serious matter to interrupt production to pick out broken glass.

In Oil Wells and Movies

Plastics are not largely used in the oil fields, but one use deserves special description. In drilling a well, the hole is started as large as necessary, and gradually stepped down with smaller sizes of casing. At each change in size, it is necessary to cement the joint to prevent leakage of water or oil in from other strata. This is done by lowering an assembly on the end of the string of casing being set, consisting of a tube containing a ball, capped at the upper end with a round valve seat to fit the ball, and at the lower end with a bottom plate carrying lugs which keep the ball from either falling out or stopping the hole, all parts being of Bakelite. With this assembly in position, tons of concrete are pumped thru the assembly into the well until sufficient to cover the strata desired. As pumping is stopped, the Bakelite ball floats on the concrete, seats and holds the backpressure until the concrete is set, and the whole is then reduced to sawdust by the drill as the well is deepened. Tests show that a two and one half inch ball requires 7900 pounds per square inch hydraulic pressure to break it on its seat, and still it is easily destroyed when its job is done.

Molded film spools were mentioned above, which carry the film in the developing bath, and the movie industry uses some sheet, rod and tube, and a few other small molded parts. Miscellaneous industries have the customary run of cases, covers, handles and other gadgets. We have recently been molding pump parts for continuous immersion in water and oil, some of them of fairly large dimensions and accuracy such that they are a press fit into a steel shell. Trouble is we don't mold enough of them.

—But a Good Future

So between bearings for carpet sweeper wheels, which must rub against a metal case without squeaking, and cams to a tolerance of 0.0005 inch, life is interesting if hectic. We believe that the more the public knows about our products the more business there will be, and the more we molders get together and exchange information and ideas, the less trouble we will have. And welcome to California. Gasoline is cheap even if molding tonnage isn't high.

Reynolds Spring Paper Weight Shows Finishes Available in Molded Plastics

HERE'S how Reynolds Spring Co. shows customers the different types of finishes obtainable in molded plastics. An airplane view of the Reynolds paperweight, molded of phenolic resinoid compound, which demonstrates six surface effects ranging from rough pebbled leather to a satiny sand-blast finish, and which reposes on the desk within arm's reach of both the molder and client. Methods of imbedding metal bushings and inserts are also shown on the bottom.

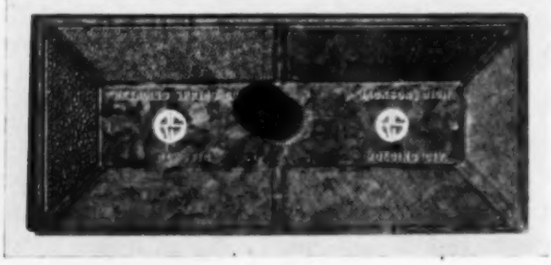


Photo courtesy General Plastics, Inc.

Monsanto Increases Wages Ten Per Cent

DURING a period of prevalent wage cuts Monsanto Chemical Works, at its St. Louis plant, has undertaken a successful experiment in wage increases.

During the second quarter of 1931, the average hourly rate paid in Monsanto's St. Louis plant, to production labor, increased 10.4% over the average hourly rate paid in the second quarter of 1929, yet the labor hours consumed per unit of output declined 23.7%, and the labor cost per unit of output declined 15.5% in a comparison of the same two periods. Due to a smaller output in 1930, comparisons with similar period of that year is even more favorable.

In explanation, Edgar M. Queeny, President, stated — "The chemical industry has never paid top wages to its operating workers, who have been recruited largely from the common labor group and then trained to operate chemical equipment. We felt that with a large surplus of high type of labor available we were accorded an opportunity to raise the standard of the average worker in our plants. The 1929 wage rate, we felt, would not be sufficient to hold a high type man permanently if and when business returned to its former level of activity. We, therefore, set a scale which we believe would continue to attract the best of unskilled men in normal times, systematically weeded out the less efficient of our workers and replaced them with the cream of the many applicants that appear at our employment office every morning.

"The experiment has been distinctly successful and barring a further slump in the chemical markets, or further downward adjustment of costs of living, which we do not anticipate, or other unforeseen conditions, we feel there is no justification to lower our prevalent wage scale.

Cotton or Paper for Nitration

A Critical Analysis of the Advantages and Disadvantages of the Types of Raw Material for the Production of Cellulose Nitrate

By Chr. Stark

Consulting Engineer—Berlin, Germany

IN the previous articles, by the present author, the question of the relative advantages of cotton and wood cellulose, particularly for the manufacture of pyroxylin were discussed (see PLASTICS AND MOLDED PRODUCTS, 1931, page 341). The conclusion reached in these prior articles was that cotton was the preferred form of cellulose for this purpose. Only in such cases where the color of the final article is of minor importance is wood-pulp indicated as preferable to cotton, and then only as to the question of price.

Up to a few years ago, paper made from cotton especially for esterification (nitration) purposes was preferred over cotton itself; but in recent times there has been a decided preference for the use of cotton as the raw material for the preparation of cellulose nitrates for the plastics arts. Less and less cotton paper is being used for this purpose.

The reasons for this change are quite diverse.

Cotton paper may be considered as a purified or improved form of cotton, because the cotton, before appearing in the form of such paper, had to undergo considerable purification and manipulation. This usually involved a thorough purification of the cellulose of the cotton, bleaching and pulping. It was believed that impurities thus removed from the cotton would make the nitrating-paper a better raw material than the cotton itself; but experts did not agree as to what effect the pretreatment of the cotton in its manufacture into paper had on the viscosity and strength of the resulting cellulose nitrates.

The large amount of research work accomplished in the past two decades has brought much light into this complex subject. By the cooperation of the cotton bleaching and paper producing factories with the manufacturers of cellulose nitrate and plastic products from the latter, much valuable data has been obtained, so that today we are in a much better position to render some intelligent decision as to which of the two products, i. e. cotton or paper made from cotton, is to be preferred for nitration.

Standardization

Much delay in cooperation was brought about by the lack of mutual confidence between the manufacturers, and the practice of secret processes, each of which produced a material that differed from all others, so that standardization, and the reaching of definite conclusions became very difficult. Not until the operators of nitrating plants began to cooperate with the manufacturers of plastics was there any real progress attained. Although much theoretical data had been published by independent scientific research workers, it was a stupendous problem to translate their results into practicable commercial operating process on a large scale.

The most important point to be considered in the manufacture of cellulose nitrate from cotton is the cleanness of the latter. Even less than ten years ago, bleached cotton was deemed acceptable even though it still contained some cotton-seed hulls. The removal of these, usually finely divided, hulls, which clung tenaceously to the cotton fibers, was a very difficult undertaking. As these hulls would not nitrate regularly, and would produce unstable nitration products, they naturally adversely affected the resulting pyroxlyn. Even after the resulting cellulose nitrate was ground and converted into the colloidal condition, as by solvents etc., in the manufacture of plastics and lacquers, these fine particles of the hulls would disturb the clearness of the resulting products. In the case of transparent materials these particles would render the product cloudy and milky; and in the case of colored goods the particles would refuse to accept the dyes, or would stain a different color from the main portion of the pyroxlin.

Attempts were therefore made during the opening-up of the cotton to remove these hull residues. Other attempts were directed for the separation of the hulls from the cellulose fibers by methods of differential floating during the washing process, as by the use of settling tanks, etc. A further effort was made to remove these materials from the ground finished cellulose nitrate by a sort of fountain arrangement, in which the ground nitrate was directed together with a large stream of water into a battery of cylindrical vessels having conical bottoms, a method of introduction being so that the material would get into a swirling motion. The theory of this operation was that the specifically

(*Continued on page 573*)

Dramatic Selling with a Molded Product

By Louis F. Dienst, Advertising Manager
The Scott & Fetzer Co., Cleveland, Ohio

ONLY in rare instances does the merchandising policy of a company have a direct bearing upon the final decision relative to the material to be used in the manufacture of the company's product or some component part thereof. The merchandising plan of the Scott & Fetzer Company, however, was the major factor in determining that the Scott & Fetzer "Crystalator" in its finished form should be made of Lumarith.

It took several months to develop the mechanical form of the Crystalator. The object of our engineering department was to produce a brand new type of crystal dispenser (or hopper) which is used in conjunction with the modern electric cleaner in applying Paradichlorobenzene crystals in their most effective form for the protection of clothing, rugs, upholstered furniture, blankets, and all other forms of household materials which are subject to attack by moths.

We had been supplying such a device with the Scott & Fetzer Sanitation System but it had proven somewhat unsatisfactory because the action was not entirely automatic, the crystals did not feed out of the old device in a constant steady stream, and no provision had been made for controlling the speed with which the crystals were released. In the new crystal dispenser, the Crystalator, it was our purpose to develop a vastly improved device which would be entirely automatic in its action, requiring no bumping or jarring to keep the crystals feeding in a constant stream. We also wanted to incorporate in the dispenser a means of controlling the flow of crystals so that the operator could at any time, by the simple turning of a lever or cap, change the flow of crystals from "full on" to "zero" without having to remove the device from the power unit of the System to make the necessary adjustment.

The red, transparent Lumarith molded crystal dispenser on the Scott & Fetzer sanitation equipment eliminates clogging and insures constant and automatic flow, far more satisfactorily than the materials it replaces. Molding was done by General Industries, Inc.

The final design of the Crystalator was not arrived at over night. Any number of various forms of dispensers were built and tried out. Some were made of celluloid, some were made of aluminum, some were fashioned out of tin. In order to feed the crystals out of the dispenser into the power unit of the Sanitation System we rely solely upon air currents which are drawn through the body of the dispenser, carrying the crystals through an aperture in the dispenser and sent through the fan of the power unit where the crystals are pulverized and forced out through the hose and nozzle and applied to the goods to be treated for moth protection.

A New Design

It happened that the best working model which our experimental department produced was made of wood. A metal cap at one end, which had a series of small holes drilled in line at the outer edge, was fitted in such a way that the cap could be revolved by simply turning it with the fingers, placing this

series of holes in various positions with the result that the air currents coming through the holes perfectly controlled the flow of crystals out of the dispenser.

After many exhaustive tests of this wooden model and some minor changes in the spacing of small holes in the body, we arrived at what we considered the perfect form of crystal dispenser. The next problem to confront us was what material to use in the final manufacture of this new device.

The Selling Angle

Members of the sales department had been called in to see the demonstration of the working model and upon observing the unusual action inside the Crystalator through a small celluloid window which had been placed in the body of the machine, it was the suggestion of the sales personnel that if possible, the Crystalator be made of a transparent material. The reason back of this suggestion is the fact that all of our merchandise is sold direct to the home through house to house salesmen and in making a demonstration to a prospective customer it has been found expedient to make the demonstration just as interesting and dramatic as possible. The moth protection feature of the Scott & Fetzer Sanitation System is one of our outstanding sales points and the sales department was quick to recognize the fact that the uncanny action in the new crystalator was something which would immediately arouse curiosity and interest on the part of the prospect. This suggestion therefore, resulted in the immediate discarding of the original intention to die-cast the part out of aluminum and instead to mold it out of a transparent or translucent material.

At this point the Purchasing Agent was called into conference and he was asked to make investigations to determine the best material available which would answer the purpose. He reported that General Industries Inc., of Elyria, Ohio, were molding parts out of a substance called "Lumarith" which he believed would fill the bill. His report indicated that Lumarith was not inflammable, practically transparent, very tough and available in various colors. The toughness of Lumarith was particularly interesting to us because of the fact that we place an unconditional five year guarantee upon the Scott & Fetzer Sanitation System and all its component parts hence we desired to make the new Crystalator out of a substance which would stand up without question.

THE salesman who goes from door to door must have a story at once dramatic and appealing. The uncanny action in the transparent molded device in the Crystalator immediately arouses curiosity and interest. Hence its adoption by the sales department of Scott and Fetzer Sanitation Systems.

Our Purchasing Department was instructed to obtain quotations from General Industries and we were agreeably surprised to find that the new Crystalator if made of Lumarith would give us exactly what we wanted and at a cost which was but slightly higher than what we had been paying for the old crystal dispenser which was made up partly of a stamped aluminum cup plus a molded rubber sleeve used to attach the device to the power unit.

In its finished form the body of the new Crystalator is molded out of red Lumarith and the metal cap at the end is of highly polished stamped aluminum. The appearance of the completed job is rich and attractive and it cannot be denied that it has real eye-value. The physical properties of Lumarith are such that every requirement of both engineering and sales executives have been met. The salesmen in the field are particularly keen about the new device inasmuch as the transparency of the new Crystalator permits them to make a very interesting and spectacular demonstration in the home with the undeniable result that more sales have been consummated. The device would have worked just as satisfactorily if die-cast out of aluminum, but certainly much eye-value would have been lost and we would have sacrificed the undeniable advantage of being able to show the customer just how it works and what takes place inside the Crystalator.

Mellon Institute Starts Packaging Research

DR. Edward R. Weidlein, Director, Mellon Institute of Industrial Research, Pittsburgh, Pa., has announced that an Industrial Fellowship for research on moistureproofing and greaseproofing paperboards used in cartons and boxes has been established in that institution by the Robert Gair Company, of New York, N. Y. Recent progress in package merchandising has indicated, he pointed out, a growing need for paperboard containers with improved moistureproofing and greaseproofing qualities.

Dr. Marion D. Coulter has been appointed a Fellow of the Institute, to conduct these scientific investigations. He is a specialist in organic chemistry and during the period 1925-1930 held a Mellon Institute fellowship for the study of certain problems in cellulose technology.

According to Dr. Weidlein. Dr. Coulter's new research on perfecting moistureproof and greaseproof paperboards for packages will be of interest to many industries.

Chromium Plating for the Plastics Industry

By Nevin Hal McKay, Metallurgist
U. S. Chromium Corporation, Pittsburgh, Pa.

WHEN a molder suggests chromium plated molds to a customer, he has reduced service charges in mind—which means a big saving when large production is ordered. Chromium plated equipment offers production economies in other angles of the industry besides resinoid molding, to wit, pyroxylin sheet polishing, laminated tubes, casting film and hydraulic press parts.

CHROMIUM plating, one of our newer industries, has become the foremost activity of "Surface Engineering". The great slogan of the paint industry, "Save the Surface and you save all", might well be borrowed by the chromium plating industry. Chromium plating was adopted by the general public in a most receptive manner because it offered the only permanent non-tarnishing lustre. As chromium plating became widely practiced, the chemical and physical properties of the deposits attracted such widespread interest that nearly all industries became concerned with the possibilities of making use of the many advantages of chromium plate. Here we have an ideal example of surface engineering because of the two general fields which chromium serves: First, Resistance to wear; and second, Resistance to Corrosion.

The resistance to wear offered by chromium plating is explained by its extreme hardness and by its low coefficient of friction. These properties are of importance in the plastic materials industry because of the abrasive action which is generally present in molding operations and applications involving these principles are discussed below. The resistance to corrosion which is offered by chromium plating is explained by its refractory or inert chemical characteristics. This property is of prime importance in applications requiring non-tarnishing or non-oxidizing surfaces.

The chromium plating as discussed in these notes is chromium deposited directly upon the base metal, with no undercoatings of copper or nickel plating, and is that branch of chromium plating which has been developed to give maximum hardness, density, and adhesion to base metal.

The hardness of the plate cannot be measured by the ordinary Brinnell or Shore method due to deformation of the metal underlying the electrodeposit. The method commonly used to measure the hardness of chromium plate depends upon the use of a slow speed abrasion machine operating under low pressure and with a standard grit wheel. Under proper conditions, chromium plate offers a hardness over ordinary low carbon steel in a ratio as high as 40:1, and a ratio as high as from 4 to 8:1 against heat treated or alloy steel. The author wishes to note here that a considerable part of his chromium plating activities deal with the chromium plating of alloy steels where the chromium plate is used for additional surface hardness. An example of this is the use of chromium on turbine blades, forged from stainless steel (generally considered hard steel) where the chromium is used to prevent the cutting or errosive wear beyond the dew point in steam turbines.

The ability of chromium to withstand corrosion depends not only upon securing perfect adherence to the parent metal but also the ability to plate with a dense or non-porous deposit. This has been of value particularly in process equipment where chorimum has been used not only to prevent attack by the varnishes or resin but also to prevent the contamination of the material especially in the manufacture of pure white or pure black colors.

Pressing Plates

The use of chromium on pressing plates used in the fabrication of laminated sheets has been a cost saving feature. In the manufacture of mirror finish or high gloss laminated sheets, the use of highly polished copper or nickel silver which were most commonly used in the past was very expensive due to the short life of the pressing plates. The life of a copper sheet was considered only three or four applications, after which the copper sheet would have to be polished or buffed before it could be again used for the making of additional high finish sheets. When chromium was first applied to these sheets, it was done in a manner similar to the plating which has been used on automobile trimmings or plumbing fixtures and yet it gave an increased life to a point where the pressing plates were making fifty or sixty applications. Today, with the deposits of hard chromium directly upon the base metal, we have recorded as high as 1100 to 1200 appli-

cations from a single chromium plated copper sheet. The advantages are obvious. The lustre of the original highly polished copper sheet is maintained by the non-tarnishing chromium. Also, the physical properties of chromium come into play on this application. The fact that chromium has very low surface tension prevents the chromium surface from being wetted by the material in contact with it, and in general, plastic materials do not stick to the chromium surface. In many cases where it has heretofore been necessary to lubricate plates or molds or tools, the use of chromium has eliminated the necessity of lubrication. This has been noted not only in the plastic industry but in many other fields where the action is somewhat analogous as in the rubber industry or in the case of handling dough in the baking industry. Although it has been impossible to procure in the United States sheets polished adequately to fill the requirements of the celluloid sheet industry, it has been possible to chromium plate the imported polished plates, maintaining the original finish, and thus provide the advantage of the metal chromium.

The use of chromium on pressing plates of special finish or decorative design have been particularly noteworthy. This may be explained by an illustration in the metal industry of chromium plating embossing or engraved rolls where, similarly to the process in molding of plastics, the property which chromium offers in reduced friction permits the material to flow and readily take the impression. In any molded material of decorative finish or color in high gloss or semi-gloss lustre, the ability of chromium to hold its high lustre and its high coefficient of reflection of light make it of importance in transmitting the light from the moulded product.

Mandrels

The use of chromium on mandrels for tubing has been another item of cost saving. Here it has been possible to eliminate or reduce sticking of the tubing to the mandrel, to improve the finish on the inside of the tubing, to produce a hard wear resisting surface on the mandrel. The use of chromium on small mandrels and irregular shapes such as hexagonal rods has been valuable because in many cases where other materials have been tried, such as nitrided nitralloy, embrittlement became a serious objection. It is interesting to note that in the case of mandrels, chromium has been widely used as a means of reclamation where mandrels have been made undersize accidently, or where it was wished to add a few thousandths to the size of mandrels.

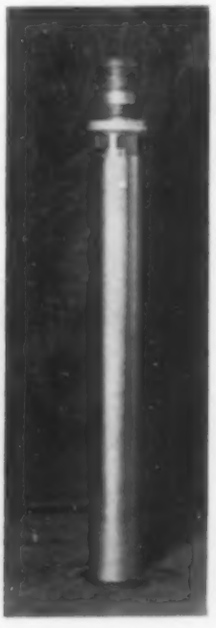
Molds

Likewise, the use of chromium on molds and dies has made it possible to retain the high finish on the tools, to eliminate or reduce the sticking of the molded products in complex shapes, to reduce the maintenance cost on molds by retaininf them in service over periods of usefulness heretofore believed impossible. One company which has used chromium in plastic material applications for three years continuous molding without refinishing the molds report that its experience covering more than 250 molds has been that in every case the mold has improved the appearance of the product and in general has reduced mold handling cost. They state that the chromium plating has been entirely profitable to them because of the elimination of the heretofore necessity of frequent refinishing of molds.

Machinery and Equipment

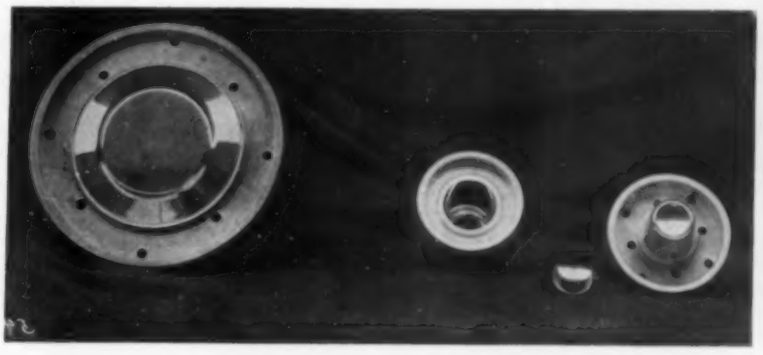
Chromium has been successfully applied to machinery and equipment. Mixers of the Banbury or Baker Perkins type, Read or Day mixers have been generally plated to resist wear and corrosion and also to eliminate the sticking of the ma-

(*Continued on page 569*)



Pump plungers such as are in service on hydraulic presses are now commonly plated to prevent pitting and gauling.

Plated molds will make improved product. The chromium eliminates lubrication and the necessity of frequently refinishing the moulds.



Pressing plate coated with hard non-tarnishing chromium to prolong life, to eliminate sticking and to improve quality of product.

Technology of Cellulose Acetate

Progress in the Preparation of this Cellulose Ester as Shown in the World's Patent Literature during the last Decade

By Dr. Aladin

Continuing this concise but comprehensive review of the world's patents on Cellulose Acetate which issued during the past decade, we now come to those patents which particularly relate to the

III. Catalysts

(*Continued from page 461, August issue*)

Serial No.	Patent No.	Patentee	Title	Brief of Description
106.	Brit. P. 301,755	I. G. Farbenindustrie A-G.	Preparation of Acetone-soluble cellulose acetates.	Zinc chloride is employed as a catalyst, either with sulfuric acid, or with hydrochloric acid, or substances which split-off the latter. The hydrolysis is effected in the usual way.
107.	Brit. P. 303,136	Ruth-Aldo Co.	Preparation of cellulose esters.	Hydrofluoric acid, dissolved either in water or in glacial acetic acid is employed as a catalyst.
108.	Brit. P. 308,323	H. Dreyfus	Preparation of cellulose esters.	Cellulose is acetated with fatty acid anhydrides, such as acetic anhydride in presence of from 5-20% of a mixture of zinc chloride and hydrochloric acid; at room temperature.
109.	Brit. P. 309,201	H. Dreyfus	Preparation of cellulose esters.	Halogenides of heavy metals in conjunction with a halogen acid, are used as catalysts. Examples: chlorides of iron, manganese, cobalt, nickel or copper.
110.	Brit. P. 310,556	Scottish Dyes, Ltd.	Preparation of cellulose acetate.	Paper or cotton is acetated with a mixture of glacial acetic acid and acetic anhydride, using pyridine-sulfuric acid anhydride as a catalyst.
111.	Brit. P. 311,790	H. Dreyfus	Preparation of cellulose esters.	Cellulose which has been pretreated with formic acid is acetylated with acetic anhydride, using either antimony, arsenic or phosphorus chloride (with or without hydrochloric acid) as catalysts.
112.	Brit. P. 312,280	Heberlein & Co.	Acetylating of cellulose.	Solution of the fiber in the acetating bath is avoided by employing as a catalyst a mixture of zinc chloride and either formaldehyde, trioxymethylene, or substances yielding formaldehyde.
113.	F. P. 603,712	L. A. Levy	Preparation of acetone soluble cellulose acetate.	See U. S. P. 1,655,870 (No. 93).
114.	F. P. 638,902	Ruth-Aldo Co.	Preparation of cellulose esters.	See Brit. P. 282,793 (No. 101).
115.	F. P. 649,623	Dr. A. Wacker Ges. f. elektrochemische Industrie	Preparation of cellulose acetate.	
116.	F. P. 660,411	Ruth-Aldo Co.	Preparation of cellulose esters.	See Brit. P. 303,136 (No. 107).
117.	F. P. 660,623	H. Dreyfus	Preparation of cellulose esters.	See Brit. P. 309,201 (No. 109).
118.	F. P. 662,624	I. G. Farbenindustrie A-G.	Preparation of cellulose esters.	See Brit. P. 291,360 (No. 104).
119.	Swiss P. 94,022	H. Dreyfus	Preparation of cellulose acetate.	A cellulose acetate insoluble in chloroform is obtained by using a bisulfate and a small amount of sulfuric acid as a catalyst.

IV. Acetylation

Serial No.	Patent No.	Patentee	Title	Brief of Description
120.	U. S. P. 1,546,679	V. B. Pease (Du Pont de Nemours & Co.)	Preparation of cellulose acetate.	Into an acetylating mixture consisting of the usual mixture and sulfuric acid as a catalyst, cellulose that has been saturated with a mixture of glacial acetic acid, acetic anhydride and small amounts of water is introduced. The cellulose acetate formed is precipitated by means of water as usual.
121.	U. S. P. 1,600,159	J. O. Zdanovich	Preparation of cellulose acetate.	Into the mixture of the cellulose with the acetylating bath, sufficient chlorine is introduced to cause partial or complete physical disintegration of the cellulose. In order to destroy excess chlorine, small amounts of sulfur dioxide are added. In the final phases, small amounts of either sulfuric acid, sulfuryl chloride or phosphorus oxychloride may be added.
122.	U. S. P. 1,604,471	D. A. Nightingale (Ketoid Co.)	Preparation of cellulose acetate.	Cellulose or hydrocellulose is treated with ketene. In order to enhance the reaction, the cellulose may previously be moistened with benzene, benzine, glacial acetic acid or acetic anhydride. Small amounts of such catalysts as sulfuric acid, zinc chloride, chlorosulfonic acid, benzene sulfonic acid, etc., may be used.
123.	U. S. P. 1,652,573	N. J. Mallabar	Preparation of cellulose acetate.	Cellulose is treated in the cold with acetic acid that contains a small amount of sulfuric acid; whereupon the sulfuric acid is neutralized by the addition of the required amount of dissolved alkali acetate (forming the alkali sulfate). Acetic anhydride and zinc chloride are then added, and the acetation carried out at 30-40° C. Finally hydrolysis of the acetate is effected by the addition of the requisite amount of water at 100° C., until samples withdrawn are possessed of the proper degree of acetone-solubility.
124.	U. S. P. 1,685,220	E. B. Middleton (Du Pont de Nemours & Co.)	Acetation of carbohydrates.	Ketene is passed into a mixture of glacial acetic acid, cellulose and a little sulfuric acid. On subsequent precipitation of the cellulose acetate, a product soluble in chloroform is obtained. Starch can be acetated in the same way.
125.	U. S. P. 1,708,787	H. Dreyfus	Preparation of cellulose acetate.	Highly viscous cellulose acetates can be produced by the use of six parts of a solvent, such as glacial acetic acid, chloroform, carbon tetrachloride, acetylene tetrachloride or benzene to each part of cellulose. For example the cellulose can be introduced into such an amount of glacial acetic acid, the catalyst (as sulfuric acid, chlorosulfonic acid, sulfuryl chloride) added, and the acetic anhydride gradually allowed to run into the mixture.
126.	U. S. P. 1,711,940	H. L. B. Gray (Eastman Kodak Co.)	Preparation of cellulose esters.	To a mass of cellulose contained in an evacuated vessel, the acetylating mixture is added; and when all the air has been displaced, the reaction is allowed to proceed at atmospheric pressure as usual.
127.	U. S. P. 1,716,422	H. T. Clarke & C. J. Malm (Eastman Kodak Co.)	Preparation of organic cellulose esters.	Mercerized cellulose is dehydrated with alcohol, and is then esterified with organic acid anhydrides as usual.

Serial No.	Patent No.	Patentee	Title	Brief of Description
128.	Can. P. 258,763	J. O. Zdanovich	Preparation of cellulose acetate.	See U. S. P. 1,457,131 (No. 87).
129.	Can. P. 258,764	J. O. Zdanovich	Preparation of cellulose acetate.	See U. S. P. 1,445,382 (No. 86).
130.	Can. P. 258,765	J. O. Zdanovich	Preparation of cellulose acetate.	See U. S. P. 1,528,810 (No. 89).
131.	Can. P. 261,560	D. A. Nightingale (Ketoid Co.)	Preparation of cellulose acetate.	See U. S. P. 1,604,471 (No. 122).
132.	Ger. P. 299,181 (1914)	E. Wagner	Preparation of cellulose esters.	Directly acetone-soluble cellulose acetate is obtained by first forming a low acetated cellulose by treatment of the same with glacial acetic acid, followed by further acetation with an amount of acetic anhydride that is less than twice the weight of the cellulose that is being treated.
133.	Ger. P. 335,359 (1913)	Society for Chemical Industry	Preparation of cellulose esters.	Cellulose is treated with acetic anhydride and catalysts at temperatures below 20° C. in the absence of the usual solvents. If desired, it may subsequently be hydrolyzed as usual.
134.	Ger. P. 339,824 (1913)	Society for Chemical Industry	Preparation of cellulose esters.	Ordinary air-dry cellulose is treated with a mixture of acetic anhydride and a solvent such as glacial acetic acid for a long time at 50-100° C., but without catalysts. The latter are only added later, whereupon the acetylation proceeds smoothly and rapidly.

This series will continue in our next issue with the British and other foreign patents falling into this group.

A. S. T. M. Outlines Intensive Program on Electrical Insulating Materials

COMMITTEE D-9 on Electrical Insulating Materials of the American Society for Testing Materials, through its chairman, H. L. Curtis, Principal Physicist, National Bureau of Standards, has summarized the projected work of the various subcommittees. Even a summary conveys the fact that this committee has a very busy year ahead of it and the results of this work should be of great value to the various industries which are involved in the materials coming within the scope of this committee.

Molded Insulation

The subcommittee in this field is developing a standard purchase specification for phenol plastic molding compounds. An investigation of the impact fatigue of molded plastics will be continued. It appears that the impact strength of specimens of different cross-sectional areas may be satisfactorily determined by dividing the energy required to break the specimen by the factor WT^2, that is, width times thickness squared. In order that values obtained from physical tests may be more exactly obtained, it is planned to study the various types of molds used in the industry and if possible to eliminate variables which affect the test specimen. This will undoubtedly lead to the establishment of suitable dimensional tolerances for best specimens and the subsequent standardization of molds for these.

Insulating Varnishes

There is a feeling that oven conditions during the baking period determine the later performance of varnish films in the tests for drying time and dielectric strength and the effects will be studied by Subcommittee 1. In addition, the measurement of hardness and oil resistance of varnish films, the measurement of acid and alkali resistance, and the insulation of varnish films will be further studied.

Plates, Tubes and Rods

This subcommittee's activities, some of which are well underway, are as follows.

1. Interlaboratory tests on the compressibility of laminated materials;

2. Developing methods of testing rods and tubes for tensile strength, flexural strength, compression strength, water absorption, dielectric strength, density, and insulation resistance.

3. Study of the effect of humidity on the dielectric strength of laminated materials;

4. Study of the effect of conditioning of samples on the results of mechanical and electrical tests;

5. An interlaboratory test

(*Continued on page 565*)

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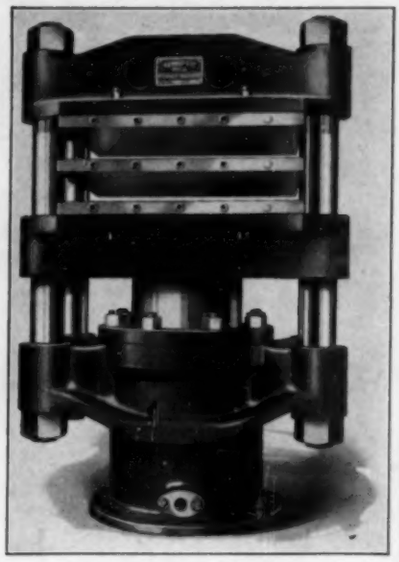

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Dr. Lawrence V. Redman

Vice-President and Director of Research and Development, Bakelite Corporation, and President-elect, American Chemical Society

LAWRENCE V. REDMAN, vice-president and director of research and development of the Bakelite Corporation, Bloomfield, New Jersey, was born in Oil Springs, Ontario, Canada, in 1880, and received his A. B. degree from the University of Toronto in 1908. He was a fellow at that University from 1908-09. In 1909 Doctor Redman was married to Miss Blossom Corey, and at present they make their home in Montclair with their two children, Alice B., and Lawrence T. From 1910-14, he was with Robt. Kennedy Duncan industrial fellow, and assistant professor at the University of Kansas where he prosecuted his researches on synthetic resins. He was president of the Redmanol Chemical Products Company from 1914-22, when his company merged with the General Bakelite Company, and the Condensite Company to form the Bakelite Corporation.

Doctor Redman gives careful deliberation to problems set before him, as is shown by the following excerpt from one of his addresses:

"Research is intended for the solid business executive who is planning for the long term future. It can have no real appeal to the get-rich-quick operator. Alluding to this fact, Doctor Redman candidly says: "If you liquidate on research, you have lost everything practically that you put into it. What have you got at the end of one year, two years, or three years? You have a notebook with some notes in it. You have no goods, and no plant that is worth having. When you enter the development period, you purchase some curious equipment, which probably will be different from anything else on the face of the earth, and will be of no use, except to the young man making the study. The liquidation value until this curve has well passed from the red into the black is very low, and may be zero. That is why most men are afraid of research. For the first five years of any new research you should be prepared mentally and financially to lose every dollar you put into it. If you are not, it is likely to be a sad venture and should not be undertaken."

"The rank and file of men in business, and not a few in the halls of learning, appear to have the impression that knowledge gained in research, if of potential value in industry, is ordinarily capable of immediate practical application. They have heard it said that research is a gamble, but in this they fail to distinguish between research proper, which is relatively inexpensive, and the industrial exploitation of research, commonly called "development," which may be a costly procedure. They are surprised when told that it is not unsuccessful research that gives most cause for concern, but it is the successful research that is to be exploited in terms of a workable process."

Research An Investment

"It is a hopeful sign that those investments are being sought for and are considered of the highest grade in the stock market which have behind them a comprehensive program of research. Investment in research is not the prerogative of the rich, but capital, large and small, as a duty and privilege may share in the risks and share in the profits through investment in securities that are backed by industries maintaining adequate research programs."

"There is no possibility for modern industry to maintain itself without research."

Until recently Doctor Redman lived in Caldwell, where he busied himself in the few spare moments at his disposal, with the delightful hobby of amateur gardening on his estate, Cro'-Nest, where his fruits and flowers became the envy and admiration of his neighbors. He also maintains a country home near Burlington, Ontario, and his infrequent vacations are spent in demonstrating American horticultural methods to his Canadian neighbors.

He is active in many chemical societies: fellow, American Association for the Advancement of Science. American Institute of Chemists: member, American Institute of Chemical Engineers. In the American Chemical Society, he has been chairman of the Chicago Section, 1918-19, and of North Jersey Section, 1930-31, and is now president-elect of the national body. In the Society of Chemical Industry, he has been chairman of the American Section, 1926-27-28. He is a member of Sigma Xi, Alpha Chi Sigma, and of The Chemists' Club, of which he was president during 1929 and 1930.

Academic Honors

Within the past year and a half, two honorary degrees have been bestowed upon Doctor Redman. One was the degree of Doctor of Science, given him by the University of Toronto, the other was that of Doctor of Laws, conferred by the University of Western Ontario.

At a fairly young age, Doctor Redman has steadily advanced to the highest distinctions, and positions which his profession can offer, but meantime, he is pursuing the even tenor of his way remaining philosphic and genial, presenting always the open mind. By his fellow workers in research, from the newest men to the veterans, he is not only respected, but beloved. Frank, outspoken, mild, yet decisive, he is generally considered the ideal leader for a large research group. His repeated election to many offices is the best attest to popularity in broader spheres of fellowship.

Paisseau Pearl Essence Patents Held Invalid by French Court

JUDGEMENT rendered June 25th, 1931 by the Tribunal of the Arrondissement of Mantua, Department of the Aine, in the case of Jean Paisseau, of Paris, vs. Eugene Collet Fils, of Oyannax, France, and Celluloid Fabrik Spayer, Kirrmeyer & Scherer, of Spayer, Germany.

History of the Case

On the 23rd of December 1930 Paisseau effected legal seizure at the place of business of Collet, at Oyannax, of various pearlessence plastics, supplied to Collet by the Celluloid Fabrik Spayer, on the grounds that the merchandize was manufactured in infringement of Paisseau's F. P. No. 570.208, of Nov. 15th, 1922 and supplementary patents pertaining to the same invention. The seizure was ordered by the Lower Court of Oyannax. The Tribunal above mentioned reversed the judgement of the Lower Court, ordered the release of the merchandise, dismissed the case against the two defendants and ordered the plaintiff to pay all costs. In their very lucid resume the French Tribunal went into the question of validity of the Paisseau patents, in so far as they had bearing on the case before them. We believe that the subject is of sufficient interest to our readers to warrant an exhaustive review.

The Tribunal's Findings

Paisseau's patents claim both a *novel process* for the "orientation" or alignment of particles of Essence d' Orient (fish essence) in plastic materials, whereby the light reflection creates certain nacreous effects of a distinctive design and a *new product*, resulting from the application of the above process.

If the product covered by Paisseau's patents be actually novel and distinctive, infringement by the defendants would be established, even though the process they employ to create the identical product were entirely different. But, if the product be merely an industrial development of a known art, an infringement claim could only be sustained, if it were proven that the new process, patented by the plaintiff, has been used by the defendant to obtain identical results.

Process Not Novel

Neither the principle of adding. Essence d' Orient (fish essence) to certain plastics, in order to create a pearly effect, nor the various applications of the above principle, are novel, being the subject matter of F. P. No. 469.694, issued May 26th, 1914 to Conrad Claessen. While Paisseau acknowledges previous developments in the art in the preamble to his patent, he claims novelty in the "systematic orientation" and "control" of an infinite variety of effects.

After claiming in the original patent and in the 3 supplementary patents that the reflection of light by the elongated particles of fish essence and the resultant effects are predicated upon the orientation of these particles, Paisseau proceeds to include in his patent all matter consisting of light-reflecting particles and all plastics, in which their might be incorporated.

The generality of this claim is incompatible with the idea of a product, well defined and distinct from any other products, not invented by Paisseau, in which light-reflecting particles have been incorporated in a plastic. A comparison of products and articles seized on complaint of Paisseau with those submitted by the plaintiff discloses a similarity of substance, to which the plaintiff succeeded in adding certain improvements in variety of design, brilliancy

etc. These, however, do not involve invention of a new product, but merely discovery of proper means to achieve certain industrial results.

Without prejudice to the case before the Tribunal, a decision of the German Patent Office is adduced, in which it was held, that Paisseau failed to substantiate his claim to invention of a new product, even if it were admitted that the process employed to create certain effects was novel.

Since Paisseau has stated in his complaint that the defendant, Celluloid Fabrik Spayer, manufactured and the defendant, Collet Fils, sold products "made by his patented process" it is evident that the plaintiff himself considers the process, and not the product, to be the essence of his invention.

In view of the fact, that the product is public property (prior art and expiration of the Claessen patent—Editor.) the complaint can only be sustained on the grounds of "use of the process" or of means to obtain certain results.

These means, or steps, of the process are indicated in a very vague form only, both in the original Paisseau patent and in the 2 supplements Nos. 28,721 of Dec. 29th, 1924 and 29,265 of March 17th, 1925.

The third supplement, dated Jan. 26th, 1927 (no number given—Editor), which contains a precise description of the original process and of the special equipment use, may cover an invention, but the plaintiff not only failed to bring proof that the defendant, Celluloid Fabrik Spayer, used his process, but arbitarily refused to submit to expert opinion on the subject, a course suggested by the defendants.

The goods seized are therefore ordered returned, the defendant's claim for damages with interest is not allowed and the plaintiff is ordered to pay all Court expenses and Counsel fees.

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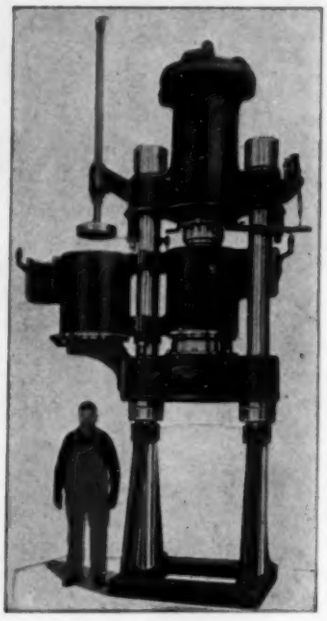

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Presses—Polishing (Hydraulic)

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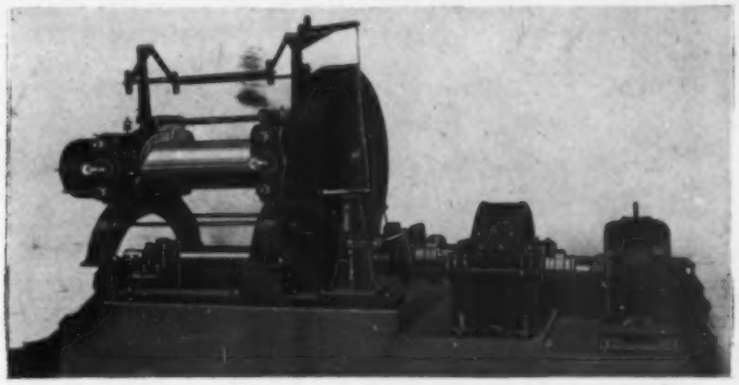

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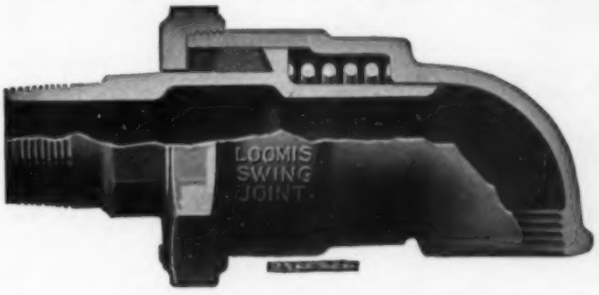

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Book Review

"Die Kollodiumwolle," by Chr. Stark. M. Krayn Technische Verlag G.m.b.H., Berlin W. 35, Paper RM. 14, Cloth-bound RM. 16. 1931.

THOSE who desire a concise and up-to-date book on the particular type of cellulose nitrate generally known as collodion cotton or pyroxylin, and who can readily read technical German, will find much of interest in a recently issued 160 page book on this subject. The author, Chr. Stark, of Berlin, Germany, has spent a considerable part of his life in the field of cellulose esters, and has gathered together in this book the latest technical data on the production of cellulose nitrate of the soluble type containing from 9 to 13.15% of nitrogen, and is characterized by its ready solubility in commercially available solvents.

While considerable literature on this subject exists, yet the great increase in the demand for cellulose nitrate lacquers is inducing manufacturers to attempt the production of their own pyroxylin—this being perhaps more true of Europe than of the United States, where the larger manufacturers of pyroxylin have so highly developed their art that a few concerns supply practically the entire country.

The last comprehensive work on Nitrocellulose or Cellulose Nitrate, is now already eleven years old, and considerable progress has been made in this art in the meantime. About every decade it becomes necessary to write a new book on almost every technological subject, and hence books of the type of the present one are always welcome.

In his treatment of the subject, the author follows orthodox lines, taking up the subject from its historical viewpoint first, and then describing, in rather more than usual detail, the raw materials entering into the commercial production of pyroxylin, such as cellulose, nitric acid, sulfuric acid, mixed acids etc. In this respect he has followed the example of Worden's "Technology of Cellulose Esters" and "Nitrocellulose Industry", only on a very much condensed scale. Inasmuch as proper understanding of the nature of these raw materials plays a most important part in the proper manufacture of pyroxylin, the space devoted thereto is about one fourth of the book.

Then follows a chapter on the theory of nitration, and another on the practical side of pyroxylin manufacture. In all cases, the production of low-nitrogen cellulose nitrate is emphasized. Bleaching, stabilization, and dehydration are also very adequately covered; this including a short resume as to the recovery of waste acids and other by-products.

A separate chapter has been devoted to the manufacture of the modern low-viscosity pyroxylins which are finding such wide application in the field of lacquers, particularly for motor vehicles.

Considerable space is devoted to the analytical features of the testing and appraising of the manufactured pyroxylin, about twenty pages being devoted to this subject alone.

That the book is primarily intended as a guide for the manufacture of pyroxylin, rather than to the working up of this material into finished products, is shown by the fact that the author devotes but seven pages to the various applications of the product.

In an appendix of ten pages, the other cellulose esters are very briefly mentioned. The index is rather short, but the detailed table of contents more than makes up for this. 65 illustrations and 2 tables complete the book.

As a monograph on pyroxylin, we recommend the work to those who desire a good general knowledge of this field of chemical industry. The book is published by M. Krayn, Technische Verlag G.m.b.H., Genthiner Strasse 32, Berlin W. 35; and is priced (in Germany) at 14 mark in paper, and 16 Mark bound (corresponding to about $3.50 and $4.00 respectively).

By Carl Marx

We are prepared to obtain copies for our readers at a slight advance over the above prices to cover transportation, etc. charges. Write to Book Department, Plastics and Molded Products, 114 E. 32nd St., New York, N. Y.

A. S. T. M. Program

(*Continued from page 556*)

will be made on the arc resistance of laminated materials;

6. A new machine is being developed for testing the impact fatigue of laminated materials;

1. Preparation of a method for testing the bonding strength of laminated materials.

Electrical Tests

A study of types of electrodes to use in measuring the resistivity of solid insulating materials will be made by the Subcommittee on Electrical Tests. In addition, the preparation of a method for measuring the power factor of dielectrics at 1000 cycles per second will be undertaken and a study of methods of measuring dielectric constant and power factor at frequencies above 10 megacycles will be planned.

Mica Products

Natural mica will be studied to determine methods for grading, measurment of thickness, and measurement of power factor and a study of pasted mica to determine hardness, edge hardness and per cent of binder will be undertaken.

N. B.

The Fifth Edition of the Plastics Guide-Book, scheduled for this Fall, will appear in the Spring of 1932. This postponement will release the book at a much more opportune time for its subscribers and advertisers.

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PLASTICS PUBLICATIONS, INC.
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NEW YORK CITY

Brazil—a Potential Plastics Market

By Robert A. Lord

Chemical Division, Bureau of Foreign and Domestic Commerce

DESPITE a growing domestic fabricating industry, which provides a market for plastic materials, the greatest demand in the South American republic is for finished articles. Mr. Lord, in this article especially prepared for *Plastics & Molded Products*, outlines the extent of our trade with Brazil.

BRAZIL is primarily an importer rather than a producer of plastics. A fair domestic output and consumption of molded fixtures, novelties, and accessories; an important paint and varnish industry; a well developed phonograph record manufacture; and other growing consumer industries, are the bases of an important potential market for synthetic resins, plastics materials, and finished products.

Raw Materials

No pyroxylin materials are manufactured domestically, but there is a small output of casein plastics. There are important sources of raw materials in the domestic cattle and cotton industries, and the expanse of timber forests. Up to date, however, utilization of casein, dried blood, and cellulose from these sources in the manufacture of plastics has been small in the case of the first, and practically unknown in the case of the last two.

Official import figures indicate that quantities of unmanufactured plastics materials are being brought from foreign countries. These appear mainly under the heading of "rubberoid" plates and sheets, imports increasing in 1929 to the amount of 1,441,561 pounds, valued at $65,925, compared to 1,090,111 pounds, worth $50,296 in the 1928 twelve-month period. Synthetic resins are not classified separately in import statistics and probably form only a small percentage of the shipments recorded as "Gums, resins, and natural balsams". These imports come chiefly from Great Britain and Germany and amounted to over a million pounds in 1929, which was only about half of the 1928 receipts. Pyroxylin scrap is not imported but domestic consumers obtain their supply from distributors of imported motion picture film.

United States exports of pyroxylin products in the form of sheets, rods, and tubes, to Brazil in 1929 amounted to only 879 pounds, worth $770, while shipments in the manufactured form came to 2,782 pounds, worth $3,562. The 1930 exports to Brazil of the former were 762 pounds, and $960, and of the latter 471 pounds, and $1,158.

Consuming Industries

Synthetic resins are consumed in the domestic manufacture of phonograph records. The output in 1928 of 721,657 units is believed to have increased materially in the past few years, since a new factory was established late in 1929, bringing the total number of manufacturers to four. Advance indications were for increased sales of these products in 1930.

Synthetic resins have not as yet displaced the natural gums in the million dollar Brazilian paint and varnish industry, thus leaving open a potential market capable of considerable development.

The domestic plastics producers are also custom molders and fabricators. Among the manufactures from plastics materials and synthetic resins produced by these and other molders are electrical fixtures, insulating materials, and a variety of accessories, and novelties such as cigarette holders; toys, gaming chips; tooth brushes, cutlery, cane and umbrella handles; mountings for hand mirrors and similar toilet articles; handbag and fan frames; buckles; bracelets; and ornamonetal and display boxes. The development of such consuming industries, however, has not been sufficient to warrant establishing additional domestic plastics producers. Considerable competition in the line of molded products is received from the imported articles and from wide use of domestic hardwoods for such products as brush, cutlery and umbrella handles, display boxes, and mountings for toilet articles.

Finished Products

The greatest plastics market is probably in the form of finished products. Besides those articles manufactured locally, already mentioned, there is a considerable import of finished products from synthetic resins, plastics materials and molding powders. The products mentioned in the following summary serve as an index to the market for such materials.

Manufactures of celluloid imported into Brazil in 1929 amounting to 204,175 pounds, and valued at $226,378 showed a fair increase over the 1928

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receipts of 176,738 pounds, invoiced at $212,205. The importation of 497,268 pounds of phonograph records in 1929 invoiced $425,475 was a quantity increase in comparison with the 1928 incoming shipments of 442,721 pounds, but with a decreased valuation of $486,201. Other groups listed in Brazilian import statistics of which finished molded products were component items in 1929 are: pipes, cigar, and cigarette holders—193,376 pounds; combs—105,313 pounds; manufactures of horn and bone (including galalith)—7,346 pounds; and tooth brushes—25,463 pounds.

There is a fairly good market in Brazil, particularly in the larger cities and trade centers, for automobile lacquers. American manufacturers shipped 11,691 gallons of nitrocellulose lacquers valued at $43,488 to Brazil during 1929 and exported $38,917 worth dnring 1930. Chief uses of nitrocellulose lacquers are for repainting automobiles and for finishing locally constructed bus bodies. Brazilians take pride in the appearance of their automobiles and it is believed that the use of lacquer for car maintenance is greater in Brazil than in the United States despite the higher cost.

Chromium Plating in the Plastics Industry

(*Continued from page 553*)

terial to the equipment. The elimination of the sticking is of prime importance in cleaning the equipment where it is necessary to change the materials or colors to prevent contamination from previous runs of materials. Rolls for digesting and calendering have also been widely plated. This has proved of considerable value in the elimination of iron and other contaminating materials from high quality products. The use of chromium on coating rolls is widely used not only in the resinoid coating of paper and cloth but also in the coated paper industry in general. Apparatus such as is used in the manufacture or working of cellulose-esters and their compositions must resist the chemicals used, must be durable, inexpensive and not cause gumming of the viscous materials which they handle.

Another application which has been carried into the plastic materials field from the asbestos industry has been the use of chromium on the plungers of pumps used as auxiliaries in hydraulic presses.

An outstanding application of chromium in this industry has been its use on the casting wheel for the manufacture of photographic films. The wheel on which the dope is cast must present a flawless mirror surface. Although this was obtained before the days of chromium plating, yet it could not be maintained, while chromium holds the lustre and has brought into consideration some of its other valuable properties in that the film produced by the deposition of the dope containing the celluloid derivative may be readily stripped from the surface of the wheel while the film is still "green", that is, while the film still contains considerable percentage of the solvent. We have in this application therefore, not only the maintenance of a non-tarnishing mirror surface and the elimination of sticking, but also the elimination of corrosion under severe chemical action.

Points on Plating

In conclusion the author wishes to point out that although the chromium platers are not molders of plastics and while molders of plastics are not in general specialists in electroplating, many of the problems can be solved by an understanding of each other's problems. Many of the difficulties encountered in the past have been due to the fact that the plastic material molders released for plating any kind of a mold in any kind of condition and the plater, unless experienced in the handling of industrial applications, treated the work much the same as automobile trimmings or plumbing fixtures using copper or nickel plating covered with a mere flash of chromium. To obtain the optimum results, chromium introduces the variables of current density, temperature and both composition, methods of electro-chemical cleaning and preparation of the surface and technique which has much to do with the hardness, corrosion resistance, and adhesion obtained and which requires close technical supervision.

ROBERT J. MOORE, Manager of the Varnish Resin Development Department, Bakelite Corporation, addressed the Niagara Rotary Club luncheon meeting at Niagara Falls, N. Y. on August 31st. His subject was "New Developments in Protective Coatings". Varnishes and lacquers made with the new Bakelite synthetic resins are coming into increasing prominence for practically every type of protective and decorative application. Their field of application includes automobiles, boats, rolling stock, buildings, and factory equipment. It would seem that varnishes made from these resins may seriously compete with the old line linseed oil varnishes, and with the newer nitrocellulose lacquers.

Mr. Moore was formerly on the teaching staff at Columbia University, where he took his graduate work in chemistry. Later, he became Director of the Fraser Laboratories in New York City, and prior to his coming with Bakelite Corporation in 1930 was employed as research chemist in the laboratories of Pratt & Lambert, Inc., Buffalo, New York.

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THIS mold—unusually hard to produce by conventional methods—was "Keller-Cut" complete in ONE set-up.
The templates shown served as masters. A draft of 1° on the side was obtained with taper mills. Cutters as small as .100" were efficiently used.
The sides of this die, left smooth by the mill under the contouring operation and having the 1° draft, needed very little finishing. Each step and the inside boss, were in exact position because a simple indexing fixture was used. With the ordinary method, this locating is a tedious job and often the work is spoiled.
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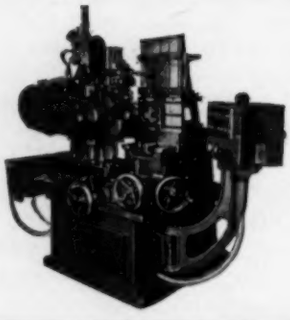

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Ingredients of a Co-operative Association Advertising Campaign

By C. B. Larrabee
Printers' Ink

TRADE association advertising campaigns have a way of vanishing into thin air. In the decade, 1921-1930, 139 such campaigns were inaugurated in national magazines. Of these, a number were successful, but an appallingly large percentage never reached first base.

An examination into the reasons for failure will reveal a variety of causes. Unreadiness to advertise, poor financing, badly planned follow-up, inequitable assessment plans, poor choice of advertising—all of these things contributed to failure.

One of the main causes for the failure of association campaigns has been that many associations have launched into advertising before they were ready for it.

Advertising, particularly when it is co-operative, needs a backing of faith. This is often not present in large enough quantities when associations start to advertise. Almost every association is made up of two groups of members, those who are advertisers and those who are not. The first group has the requisite faith. The second generally does not understand advertising and as a rule expects too much from it or else agrees half-heartedly to a co-operative campaign without believing that it can ever succeed. It is this second type of member who runs to cover at the first sign of trouble, who is loudest in his demands that advertising produce magic results.

The first question that any association must ask itself when some enthusiastic member proposes an advertising campaign should be, "Are we ready to advertise?" That is a question which cannot be answered quickly. It requires much serious thought.

A second essential of a successful association campaign is a longtime program. Associations do not differ from individual companies in their need for the cumulative value of advertising. No manufacturer ever conquered his market with a single advertisement and few manufacturers, indeed, ever made an appreciable dent in their market with a year's campaign. Yet many an association expects to conquer the world in twelve months.

Expectancy of Results

Association advertising is peculiarly stringent in its demands for long-time campaigns. Even at best results are often quite intangible at first. Association machinery is often slow in getting under way to capitalize the campaign. Frequently the job to be done is large, such as changing consumer buying habits or creating new trends in consumer thought. Obviously it requires more than twelve insertions to accomplish a job like that.

An association campaign should benefit the whole industry, not just a few of the members. Several years ago an association was formed to promote the welfare of a certain kind of machine equipment. Two companies controlled about 75 per cent of the industry's business. These two companies forced their ideas down the association's throat and a theme was chosen which benefited the small manufacturer very little. The result was that the two leading companies got about 95 per cent of the benefit of the campaign. Of course, the campaign endured for less than a year and within a couple of years the association itself was merely an unpleasant memory.

Association copy should fight shy of the institutional as far as possible. At first this may seem to be an impossible hope. "Isn't association advertising essentially institutional? How can it be anything else when the association has no individual product to sell?" Those are two questions that are bound to be asked.

The answer is that associations do have products to sell just as much as their manufacturers. Certainly "Say it with flowers" isn't institutional. Nor is "Save the surface." Nor are the themes of most successful association campaigns.

The association should be willing to leave its advertising progress in the hands of a compact group, call it an advertising committee or what you will. If the committee fails it should be replaced by another committee of equal size— not by a convention sitting as a committee.

MR. LARRABEE'S series of articles on Association Advertising, which have appeared in several recent issues of Printer's Ink, contain many salient thoughts. Some of these, abstracted with permission, may prove timely to the Industry in its consideration of this problem.

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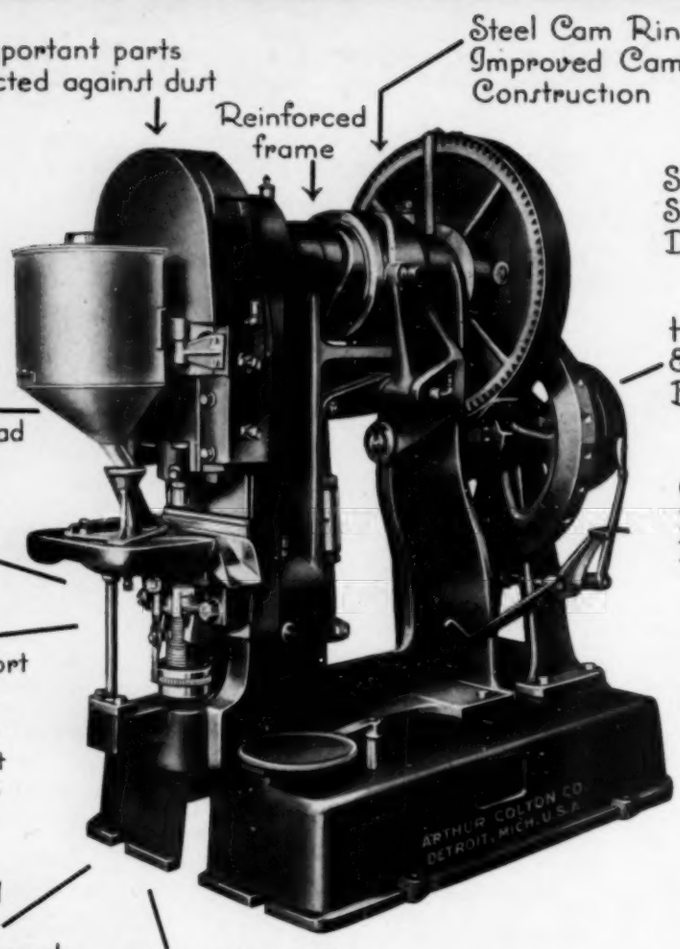
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The problem of inquiries is important. The primary consideration must be that inquiries are properly answered. This means the preparation of sales literature which lives up to the association's advertising and up to its members' products. It means the preparation of good sales letters, of follow-up letters, if necessary, to keep the association in the mind of the prospect.

Handling Inquiries

The question of distributing inquiries to members is a ticklish one and should be thoroughly understood by all members before any advertising is published. Sometimes members are divided by sections of the country and if this is true the distribution of leads is simplified. When several members work on a national scale, great care must be exercised to see that all members, both large and small, get an even break.

Wise trade associations will not let past failures by other associations deter them from co-operative advertising. They will study the failures and avoid those things which lead to failure. They will search out for themselves the necessary ingredients for successful association advertising.

Advertising is a logical tool for associations. It allows members to do co-operatively what they cannot accomplish individually. The expansion of trade association activities which should take place in the next decade will depend to some extent on how much associations understand of the pitfalls as well as the possibilities of association advertising.

Campaign Financing

Of all the phases of association advertising, financing is the most important. It is the rock on which most unsuccessful co-operative campaigns founder—and on occasion it has been the one factor that stood between the success and failure of an association plan.

However, there are certain accepted methods of financing that have worked with varying success. Let us, therefore, examine the principles of these methods to some basic necessities of any good financing plan.

Boiled down to essentials, there are three generally used plans of raising the money for association advertising campaigns. Each one of these plans has certain variations that have been tried out, sometimes successfully, sometimes unsuccessfully. They are, briefly, first, appropriations from the general funds of the association; second, assessments for advertising from members based on members' production; third, voluntary contributions.

The success of the first method depends greatly, of course, upon the size of the general funds of an association. Since the amount of money that an association has to work with is made up by membership and other fees from members, this method of financing is bound closely with general methods of association financing. This opens up a broad subject quite outside the scope of this article and so we shall have to assume for all ordinary purposes that the association money-raising mechanism is satisfactory.

In planning for an association campaign to be taken out of the general funds, the membership dues must be adequate to take care of all phases of the association's activities. If the members have no particular objection to paying dues of sufficient size to take care of ad-

(*Continued on page 580*)

Cotton or Paper for Nitration

(*Continued from page 549*)

heavier particles would thus be forced into the conical bottom portion of the apparatus, while the suspension of the clean fine fibers would overflow from the apparatus. The main defect of this type of operation was the enormous amount of water required, and the size and cost of the device.

To avoid these difficulties, it was therefore formerly considered good practice to buy cotton paper, which was devoid of these undesirable impurities. During the past few years, however, the purification of cotton itself has been so effected that today cotton of a purity equal to that of the cotton paper is commercially available for nitration. Modern purified cotton suitable for nitration is obtainable in the bleached condition, free from hull particles and otherwise entirely suitable for the purpose.

Most nitrating-cotton is now sold on the basis of a definite color, copper number, viscosity, fiber-length, etc. For example, in the United States the Herclues, Powder Co., (Wilmington, Del.) has developed and sells bleached cotton suitable for any type of esterification; such as for the manufacture of pyroxylin and pyroxlin plastics, artificial silks such as nitrosilk, cuprammonium silk, acetate silk, viscose silk (Rayon), low or high viscosity collodion cotton (pyroxlin), films, etc. From the diversity of the products made from such cotton, it will be evi-

TABLE I

Type of Cellulose	Properties	Weight before nitration	Weight after nitration	% loss of acid
1. Bleached cotton	long fiber	10 Kg.	25 Kg.	150
2. Bleached cotton	medium fiber	10	23.5	150
3. Bleached cotton	short fiber	10	22.3	123
4. Bleached paper	26 g. per sq. m.	10	29	190
5. Bleached paper	22 g. per sq. m.	10	27	170
6. Bleached paper	16 g. per sq. m.	10	26.5	165

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according to own formula.

C. STARK
LABORATORIES FOR PLASTIC MATERIALS
BERLIN—Charlottenburg, 5, Pestalozzistrasse, 56a.

dent that various grades thereof are particularly adapted to a specific use. Now that cotton of such purity is obtainable, the advantages of the cotton-paper for esterification have been virtually eliminated.

Furthermore, nitrating paper required more nitrating space as it was more voluminous, and also more time; more acid was used up; and the paper cost more per pound than did the cotton.

Torn nitrating-paper occupies about 10 to 20% more space than cotton, so that the capacity of the nitrating plant is thereby diminished and the cost correspondingly increased. For this reason a number of attempts have been made to carry out the nitration of the paper in a continuous web; among these being the processes of Schupphaus and of White, which were quite highly developed. They did, however, suffer from the defect that they occupied very much space and were too complicated for economic operation. The logical step, in the use of nitrating-paper with either to tear up the paper prior to its introduction into the nitrating bath, or to allow the paper to unroll into the bath while at the same time stirring the latter vigorously to prevent adhesion of the particles of paper to each other.

Advantages of Cotton

Cotton, on the other hand, has the advantage that it can be more evenly and rapidly penetrated by the nitrating acid mixture, and that thereby the process is shortened. Also, from 10 to 20% more cotton, by weight, can be nitrated at one time in a given volume of nitrating acid mixture. The acid-losses, in the case of the nitration of paper is from 20 to 50% greater than when operating with cotton. One reason for this is that the paper more thoroughly absorbs the acid in the capillary openings of the individual paper fibers; and the acid thus entrapped can not be so readily removed by centrifu-

gals as can the acid from nitrated cotton. According to the density of the nitrating paper, from 20 to 50% more acid adhered to the latter than to the cotton; as the table will readily demonstrate.

The paper used had the same thickness, but varied in density.

From the above table it will be seen that the amount of acid retained by the cellulose after the nitration amounts to from 1.23 to 1.5 Kg. in the case of cotton; and from 1.65 to 1.9 Kg. in the case of nitrating-paper. Calculating that each kilogram of cellulose will take up from 0.2 to 0.3 Kg. of nitrogen as a result of the formation of the nitrate, it will be evident that from 1 to 1.6 waste mixed acid, which might have been regenerated, remains absorbed irretrievably on the cellulose. This acid is washed out during the subsequent washing of the nitrated cellulose, and hence is a total loss. This, therefore, is a further reason why cotton should be preferred to nitrating-paper.

Price Considerations

The final, and very important, consideration is the matter of price. The ratio between the price of nitrating paper and cotton of a sufficiently pure grade for direct nitration is at present about as 20: 14 or 3:2; i. e. the paper costs about 25% more per pound. It must however be mentioned that the yield of finished pyroxlin, in the case of paper is from 5 to 15% greater than in the case of cotton. This is caused by the fact that the paper is still the purer of the two, so far as the cellulose content thereof is concerned.

In conclusion therefore it may be stated that the former advantages of nitrating paper have been removed from consideration by the advance realized in the preparation of cotton for nitration. The main advantages of the cotton over the paper may be summarized:—

Shorter nitration time, less consumption of acid, lower price of the cotton.

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TECHNICAL ABSTRACT SECTION

A Review of Literature and Patents

Ink For Cellulose Esters. John H. Clewell, of Arlington, New Jersey, assignor to Du Pont Viscoloid Company, of Wilmington, Delaware. U. S. P. 1,806,965; May 26, 1931.

	Grams
Diacetone alcohol	200
National nigrosine base N	20
Orange shellac	80

The above, it will be noted, comprises a solvent for either cellulose nitrate or acetate, e. g. diacetone alcohol, a dye, and a thickener, e. g. shellac. Any good nigrosine base may be substituted for the black one given. Blue ink can be made by the use of any of the spirit blues, and green by the use of malachite green or diamond green. Other suitable gums may be substituted for the shellac. The diacetone alcohol, boiling point about 160° C., represents a good cellulose ester solvent (and dye solvent) which gives sufficiently rapid drying without being too highly volatile. In making up the composition, dissolve the nigrosine in the alcohol, filter, and then add the shellac. The rate of drying can be increased by an addition of methyl acetone and decreased by an addition of triacetine.

It will be evident that the proportions of the ingredients may be considerably varied from those given above. An important feature is the use of a high-boiling solvent which has a strong solvent action on the material to be marked, and at the same time is a good solvent for dyes. The boiling point of the solvent should be high, so that the ink does not dry on the printing tool, but not so high as to retard its drying rate unduly.

Combined or Backed Sheets of Plastic Material. Jean Paisseau, of Paris, France. U. S. P. 1,808,372; June 2, 1931.

Process for the manufacture of sheets of plastic material which are combined or backed, consisting in applying, on a sheet of plastic material, a layer of a mixture adapted to attack but superficially the said sheet of plastic material and composed of a plastic material similar to that of the said sheet dissolved in a volatile compound comprising a mixture of a solvent of the said material and of a volatile lqiuid unable to dissolve the said material.

Process for the manufacture of sheets of plastic material which are combined or backed, consisting in applying, on a sheet of plastic material, a layer of a mixture adapted to attack but superficially the said sheet of plastic material similar to that of the said sheet dissolved in a volatile compound comprising a mixture of a solvent of the said material and of a volatile liquid unable to dissolve the said material, and in subsequently subjecting said sheet thus prepared to the action of a polishing press.

Production of Urea. Alfons Klemenc and Rudolf Schoeller, of Vienna, Austria, assignors to I. G. Farbenindustrie A.G. U. S. P. 1,808,465; June 2, 1931.

It is now found that urea can be produced directly from carbon oxysulphide and ammonia and without an isolation of intermediarily formed ammonium thiocarbamate by causing reaction between carbon oxysulphide and ammonia to take place while at least one of the said two reagents is at leas tin part in a liquefied state, and then heating the reaction mixture under pressure.

Example

7 parts of gaseous ammonia and thereafter about 4 parts of carbon oxysulphide are liquefied in an iron high pressure apparatus provided with a manometer and the necessary valves, by cooling the said apparatus with liquid air. The apparatus is then slowly heated to about 120° C. in an oil bath and kept at this temperature for about three hours. After this time the reaction is complete. The pressure in the high pressure apparatus is then about 36.4 atmospheres. After cooling, the gaseous hydrogen sulphide which produces the pressure in the apparatus, is released and the content of the apparatus dissolved in water. After filtering off any impurities (chiefly iron sulphide formed from the iron wall of the apparatus) the urea is separated in the usual manner. 69 to 70 per cent of the ammonia is converted into urea as results from the quantitative determination of the nitrogen by the method of Kjeldahl.

Moldable Material and Process. Roy E. Coleman and Frank J. Groten, of Meriden, Conn., assignors by Mesne assignments, to the Monowatt Electric Corp., of Bridgeport, Conn. U. S. P. 1,808,529; June 2, 1931.

The present invention contemplates the provision of a moldable material from which molded articles can be made expediously in heated dies or molds to give them their shape, form and finish, so that they may be subsequently cured and hardened if necessary at high temperature out of the molds. According to the present invention the material is suitable for use in the manufacture of molded products, such as used in wiring devices, electrical insulation and in various products not of an electrical nature. These articles are of comparatively high strength, have resistance to shock and acquire a high polish during the molding process.

These moldable materials or the molding composition may be considered as consisting essentially of two principal components, each of which is susceptible of independent variation in its constituents to a very large degree. These two principal components make up substantially the entire mass of the moldable material. Either may include an added or inherent plasticizing agent with or without a volatile solvent, or such plasticizer and/or volatile solvent may be added to the mixed components.

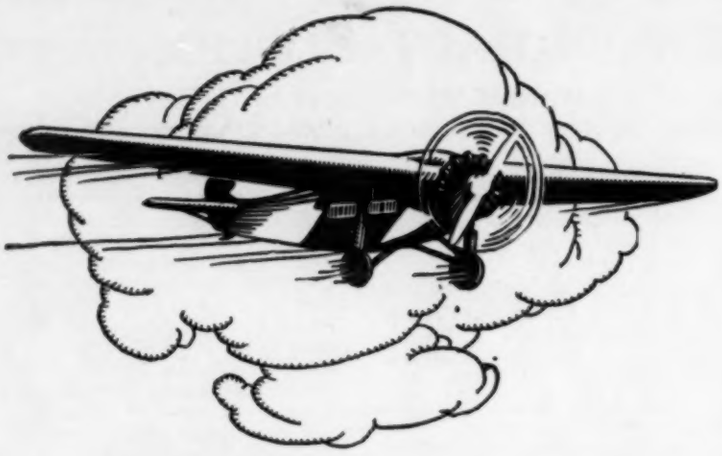
In accordance with the present invention relatively slow hardening binders are used in a novel way to replace part of the fast molding binders in so-called "hot molding" compositions, and as a consequence, new and improved products result. Briefly, the process comprises the following steps: A filler is first coated, impregnated, or otherwise intimately associated with a slow hardening binder and the mixture is subjected to polymerizing or oxidizing conditions to partially harden the binder. The partially hardened product after being comminuted by grinding or any other suitable means, finally is mixed with a proportion of a fast molding compound such as a synthetic resin with or without a filler, and the mixture molded under heat and pressure for a very short time.

Synthetic Resinous Complex and Method of Making Same. Israel Rosenblum, of Jackson Heights, New York. U. S. P. 1 809,570, June 9, 1931.

This invention relates to fusible and soluble condensation products of a new and improved type derived from the interaction of an organic salt of a metal, a phenol, or a mixture of phenols, and an aldehyde, in the presence of a suitable solvent, preferably either a cracked or dry-distilled natural resin, such as wood rosin, which has been heated to a temperature of 260° C. or above, or a mixture of glycerol mono and di-esters prepared at lower temperature from such dry-distilled natural resin.

Example 1

1000 pounds of the mixed esters, obtained by treating dry-distilled wood or stump rosin with glycerol and containing large amounts of glycerol mono and di-esters are heated with 400 pounds of phenol, 20 pounds of zinc abietate and 200 pounds of formaldehyde (40% solution). When practically all of the formaldehyde is absorbed, the water is distilled off and the temperature is gradually raised to about 240° C. or higher. When the acid value is about 9, the reaction is complete. The reaction product is a gum of high melting



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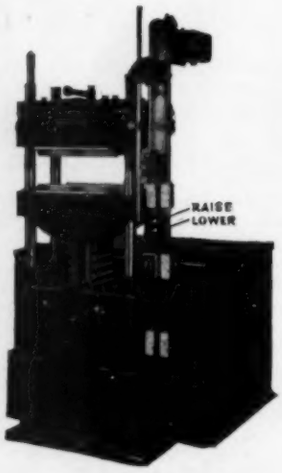

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In place of dry-distilled wood or stump rosin, any other similarly treated natural resin may be used, while other organic salts of zinc, such as the oleate, stearate, tungate (which are in the nature of soaps), the acetate, etc. may be used, and also the corresponding salts or soaps of other metals, although I prefer to use the salts which, like zinc abietate, are formed from an acid which is more or less resinous in character.

Process of Producing Oil Soluble Phenol - Aldehyde Condensation Products. Fritz Seebach, of Erkner-Berlin, Germany, Assignor to Bakelite G. M. b. H., of Berlin-Charlottenburg, Germany. U. S. P. 1,809,732; June 9, 1931.

Example 1

100 kilos of a phenol-aldehyde condensation product capable of hardening are fused with 40 kilos of β-naphthol and, the main reaction being completed, the mass is heated during 1½ hours at 260° C.

Example 2

100 kilos of a phenol-aldehyde condensation product capable of hardening are fused with 40 kilos of β-naphthol and ½% super-oxide of manganese, the temperature not increasing more than up to 145° C. After 10-15 minutes the contents of the condensation apparatus is discharged into a flat receptacle.

Example 3

120 kilos of a phenol-aldehyde condensation product capable of hardening, 120 kilos of a phenol-aldehyde condensation product (Novolak) not capable of hardening, 50 kilos of β-naphthol and ½ kilo of hydrated oxide of manganese are heated,—the main reaction being completed,—for 10-15 minutes at 140° C. and then discharged into a receptacle.

Example 4

120 kilos of a phenol-aldehyde condensation product capable of hardening, 120 kg. of a phenol-aldehyde condensation product not capable of hardening (Novolak), 50 kilos of β-naphthol and ½ kilo of hydrated oxide of manganese are maintained, after completion of the main reaction for 10-15 minutes, at 140° C. by introducing steam at a pressure of 3-4 atm., and then discharged into a receptacle. The resin thus obtained contains hardly any volatile substances, the analysis showing 0,7% volatile substances. After completing the heating vacuum may be applied, at the same time conducting a current either of air or of an inert gas, such as carbonic acid, through the mass. The removal of gases from the hot resinous mass is thereby facilitated. By employing inert gases the danger of explosion is avoided.

Example 5

Equal parts of hardened phenol-aldehyde condensation product (in the so called C-state) and 2,2′-dihydroxydiphenyl (diphenol) are heated together until the condensation product is dissolved and no more water evaporates. The resulting resin is easily soluble in hot fatty oils.

Example 6

75 kilos of a fusible phenol-aldehyde condensation product capable of hardening (so called "Bakelite") are caused to act upon 25 parts of resorcin until the reaction is completed, which is the case as soon as the aqueous vapours cease rising. The resulting resin is easily soluble in cold oils.

Example 7

50 kilos of fusible phenol-aldehyde condensation product capable of hardening are caused to act upon 30 kilos of the molecular compound of β-naphthol and acetamide. The resin thus obtained is soluble in cold fatty oils.

Example 8

The process is carried out according to Example 1, after adding 5% of nitronaphthalene to the reaction mass, the latter thereby being more easily maintained liquid. Instead of adding nitronaphthalene gaseous oxides of nitrogen may also be conducted through the mass.

Process For Treating Resins. Paul Stuhlmann, of Cologne-Lindenthal, Germany. U. S. P. 1,809,738; June 9, 1931.

The invention relates to a process for treating resins. One of the principal objects of the invention is to harden dark, and even light resins, such as tree-stump resin or balsam resin, at the same time as bleaching them. Further objects are to provide improved processes of bleaching and/or hardening natural resins and to produce improved products therefrom.

An example of the process for carrying out the present invention is given herewith.

The resins, more or less finely divided and, if necessary, ground, are dissolved in the cold in a dilute alkaline lye which is kept in continuous motion by stirring mechanism, pumps, air circulation or the like. Any additional substances are also admixed with this solution.

The usual bleaching agents, for example, hydrogen peroxide, sodium perborate, or others, which can be added separately or several together, can be added to the resin solution during solution or following immediately thereon. Aldehydes, such as formaldehydes or furfurol, are added in addition to these bleaching agents, which together with the usual bleaching agents, effect excellent bleaching or decolourization of the resin solution and also harden the resin at the same time. This bleaching and hardening process is carried out in the cold. The action can be assisted by adding phenols and other hardening agents.

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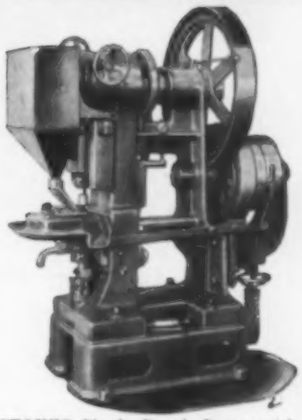

*STOKES Preform Presses in American Record Corporation Plant, Scranton, Pa. Installation views of STOKES Presses in other leading molding plants have appeared and will follow in other advertisements.

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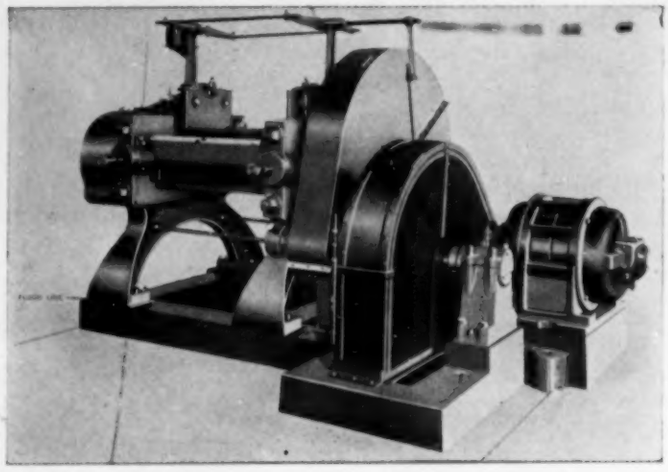

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Co-operative Advertising

(*Continued from page 573*)

vertising along with other activities, this first form of financing the campaign is probably the most satisfactory of all. It bears the closest analogy to the most generally accepted method of financing advertising campaigns for individual manufacturers who draw their advertising appropriations from their entire capital and consider advertising as a legitimate expense along with production costs, sales costs, etc.

Special Assessments

The second method of financing the advertising is by a special assessment based on shipments from members. In other words, each member pays into the advertising appropriation of his association a special amount determined entirely by the amount of merchandise he ships. This is a fair method of determining the advertising appropriation, but it also suffers from the drawback that when business is bad the advertising appropriation gradually fades into nothing. This may not seem so vicious at the beginning of a depression when business is slipping off and cannot be brought back by any method of resuscitation. On the other hand, any well-informed business executive knows that one of the most effective strategic moves that he can make is to start advertising as soon as the business curve shows a sign of an upswing. Associations using the assessment plan are automatically barred from doing this strategic advertising because they cannot put on the required pressure until members' sales begin to pick up. Thus, a sales curve that might be pushed up with some rapidity rises more gently because of lack of advertising pressure.

The third method of financing the campaign, that is, by voluntary contribution is probably the least satisfactory of

all. It has the great drawback of passing the buck to the advertising-minded members and allowing those members who are not advertising-minded to get the benefits of the campaign without contributing their share. It also requires high-pressure, money-raising activities that are likely to leave sore spots in the minds of a number of members.

However, the voluntary contribution plan has been used by a few associations with apparent success.

Perhaps the most important factor is that of long-term financing with which is tied up the factor of some kind of advertising reserve.

The necessity for long-term financing and a reserve become apparent to anyone who has studied business curves even in good times. After all, a cycle is a cycle with its hills and valleys. If the advertising fund depends entirely upon those hills and valleys the advertising effort is likely to be sporadic.

It is safe to say that the most successful association advertising campaigns have been those that have been financed on the basis of long-term effort. Members have been told that six months or a year of advertising it not enough, but that two or three years are a minimum and that if there is any appropriation to be made at all it must be made on a basis of two or three years of effort.

It is not enough, however, to sell the idea of long-term advertising. It must be correlated with an advertising reserve built up to take care of periods when the industry is not earning as much as it does in good times.

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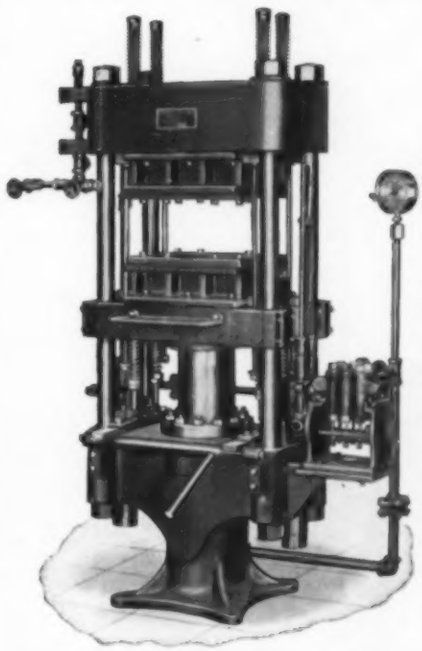

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Westinghouse Electric Dividend

THE board declared a dividend of 1¼ percent amounting to 62½c per share, on both common and preferred shares (payable October 31, 1931 to stockholders of record September 30, 1931), payment of which will make a total of 7¾ percent paid this year on the par value of both classes of stock, which compares with 10 percent paid in 1930.

Fiberloid Corporation

DECLARED a dividend of 75 cents a share on the common stock. The last previous payment was $1 a share, made July 1, 1931. The regular quarterly dividend of $1.75 a share on the preferred stock was also declared. All dividends are payable October 1 to stock of record September 18.

Asbestos Companies Combine Sales Forces

SALES of the products of the Ambler Asbestos Shingle & Sheathing Company, Ambler, Pa., will hereafter be handled through a combined sales force under the name of its parent company, the Keasbey & Mattison Company, also of Ambler.

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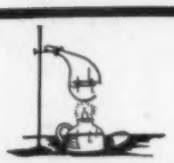

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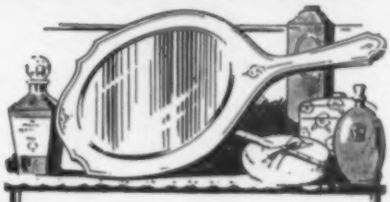

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And Now, In Closing:

ABOUT the newest thing on the Woolworth counter is a wooden desk set that holds a casein pen and pencil . . . Keystone smelling salts, Vail's and Emelie's toilet preparations are other ten-cent items with plastic closures . . . The entire Woodbury line, especially the skin freshener, should join the same army. . . and while we are on it, Joubert's closure should be more in keeping with the jar . . . In the more expensive line there are several new arrivals . . . including: Neo-Derma Shampoo, Ayer's nail preparations and Lionceau perfume . . . The Radio World's Fair, just attended, proved even more hopeless than its predecessors . . . Our impressions all center around a loud-mouthed salesman of vacuum cleaners, a recording booth where young hopefuls could preserve their vocal disturbances . . . and television to ruin your eyesight . . . It was the same old furniture show, except that the sets were so well disguised in trick cabinets that you could only find them by the price tags . . . Standard Machinery has a new bulletin, and General Electric's booklet,"Plastic Products," is the finest molding brochure so far . . . beautiful illustrations of thought-provoking products, well described . . . The suit of 21 tube companies against R. C. A., involving $47,000,000, has been settled . . . This should mean some pick up for bases . . . R. B. Stringfield, who has an article in this issue, writes us a letter on the needs of the molder . . . he says, in part, that "the Plastics Symposium at the Chemical Industries Exposition is the most encouraging thing we have had so far" . . What do you mean,—"we?" . . . Remember the power of THE PRESS! . . . Orders are still slow to come in volume, but of higher quality . . . many of the idle presses—and men—will remain idle for some time . . . collections are poor, but they are greatly hampered by loose credit terms . . . Vacations are over for another year, with many a European trip turned into a Coney Island or a Revere Beach . . .

A GREAT deal can be said on this subject of credit, and much of it has already been aired. However, many in this plastic industry feel they are not like other men in other industries. In order to get business, they often agree to a long term discount, such as 2% on the tenth of the third month following delivery, and trust in good fortune to finance the work until then. What if the buyer does lay down the terms? If none of us agreed, he would soon change. And most unfortunately, many a buyer has been approached, and many a good job harmed, in this way. The Molders Association, facing another year, should require co-operation on this point. In effect, it is a form of rebate that stays within legal limits but is always outside the boundaries of ethical business.

Dull Days and Dark Meat

YOU know, we got to debating here the other day—those of us who were out at Detroit—as to who had made the best speech. Some of the boys thought no one had made much of a speech, but I differed with them. I said I thought the fellow who said he was tired and wanted to go to bed, made about the best one, and I still think he did.

SAY, where is that fiery meteor, The Hot Platen? So warm it burned itself out, or are we just off the free list?—*Old Bill.*

Both from the Durez Molder

"We can't employ salesmen, no matter how good they are; we can't launch a sales campaign now, or buy new equipment, new materials or new ideas." In fact, the quotation above means that "We cannot afford to get new business." It is on many lips today, and it is based on the fact that the company must pay wages, keep operating, maintain a dividend payment. Few will admit that, in some form or other, they have cut the wages and have reduced their budget. Lower material costs, lower equipment prices, shorter hours and fewer working days mean a large saving for a plant even if orders are few and far between. There is a scarcity of "better mouse traps" these days, and if a manufacturer expects the public at his door, he must resort to proper selling. Proper selling means three fundamental things: *consistent* selling of a *good* product through the *proper* channels. Economy on sales effort is often the reason for idle equipment. More than anything else, it serves to reduce price standards. The most successful companies in every line of business are those that increased selling effort in a time of idle public acceptance. That effort must surely come before the wheels of industry grind any faster.